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Case Report

A Rare Association of a Ruptured Anterior communicating Artery Aneurysm, a Non-ruptured, Left-middle Cerebral Artery Aneurysm and Transposition of Aorta

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INTRODUCTION

The association of congenital cardiovascular disease and ruptured cerebral aneurysms is rare. The well-recognized cerebrovascular complications of congenital heart diseases include ischaemic stroke, embolic stroke, mycotic aneurysms resulting from infectious endocarditis, and intracranial aneurysms associated with coarctation of the aorta or aortic arch interruption [1–3]. Transposition of the aorta is an unusual anomaly of the cardiovascular system. The association of cerebral aneurysms with transposition of the aorta is extremely rare. We present a patient with this rare association and discuss the previous literature on the subject.

CASE REPORT

A 51 year-old woman was hospitalized with sudden onset of headache, nausea, vomiting, and disturbed consciousness with a score on the Glasgow Coma Scale of 13 (E3V4M6). Computed tomography (CT) revealed diffuse subarachnoid haemorrhage (Fisher group 3). Serial angiography showed a ruptured, anterior-communicating artery aneurysm (Fig. 1), non-ruptured, left-middle cerebral artery aneurysm (Fig. 2) together with a transposition of aorta (Figs. 3 and 4). Carotid and subclavian arteries arose directly from an aortic arch that passed through the right thorax. A brachiocephalic artery was not noted on the angiogram. Cannulation of the right carotid artery was technically very difficult, and aortography using three-dimensional analysis was carried out, which proved helpful in detecting the anterior-communicating artery aneurysm. Surgical clipping of both aneurysms was carried out via a left frontotemporal craniotomy the day after admission. Postoperative angiography confirmed the diagnosis of the transposition of aorta with both carotid and subclavian arteries arising directly from it. Her postoperative clinical course was uneventful, and she was discharged 6 weeks later.

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DISCUSSION

The association of congenital cardiovascular diseases and ruptured cerebral aneurysms is a rare clinical entity. The well-recognized cerebrovascular complications of congenital heart diseases include ischaemic stroke, embolic stroke, mycotic aneurysms resulting from infectious endocarditis, and intracranial aneurysms associated with coarctation of the aorta or aortic arch interruption [1–3].

Transposition of aorta is an unusual anomaly of the cardiovascular system. This association of cerebral aneurysms and the transposition of aorta is extremely rare. Schievink *et al.* [4] reviewed their experience with non-infectious intracranial aneurysms and cervicocephalic arterial dissections in patients with congenital heart disease at the Mayo Clinic between 1969 and 1992. Congenital heart disease was diagnosed in three (8%) of 36 children with intracranial aneurysm; in five (0.3%) of 1994 adults with intracranial aneurysms; in one (4%) of 25 children with cervicocephalic arterial dissections; and in five (2%) of 250 adults with cerviocephalic arterial dissections. The congenital heart disorders consisted of complex cardiac anomalies in three patients (truncus arteriosus, transposition of the great arteries, and tricuspid atresia in one patient each), pulmonary valve or arterial stenosis in two patients, aortic coarctation in four patients, and bicuspid aortic valve in five patients. Only one patient had an intracranial aneurysm and coarctation of the aorta. They found only one 26 year-old man with an intracranial aneurysm (middle cerebral artery aneurysm) and transposition of great arteries. We present a patient with the rare association of cerebral aneurysms and transposition of aorta, the second such case to be reported. Individuals with a variety of congenital heart disorders may be at an increased risk of intracranial aneurysm development particularly in

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Fig. 1 – The three-dimensional aortography revealed an anterior communicating artery aneurysm.

Fig. 3 – The anteriposterior view of an aortography showed that bilateral carotid and subclavian arteries arose directly from an aortic arch passing through the right thorax. A bracheocephalic artery was not noted on the angiogram.

adolescence. This may be because the arteries of the head and neck are derived from neural crest cells, which also play an important role in early cardiac development. This suggests that an abnormality of the neural crest may be the common pathogenetic factor explaining the association. The importance of this finding is that patients with cardiovascular anomalies have a risk of associated cerebral aneurysms, and should be screened with magnetic resonance angiography. Abnormalities can then be confirmed with cerebral angiography.

Fig. 2 – The left carotid angiogram revealed a middle cerebral artery aneurysm.

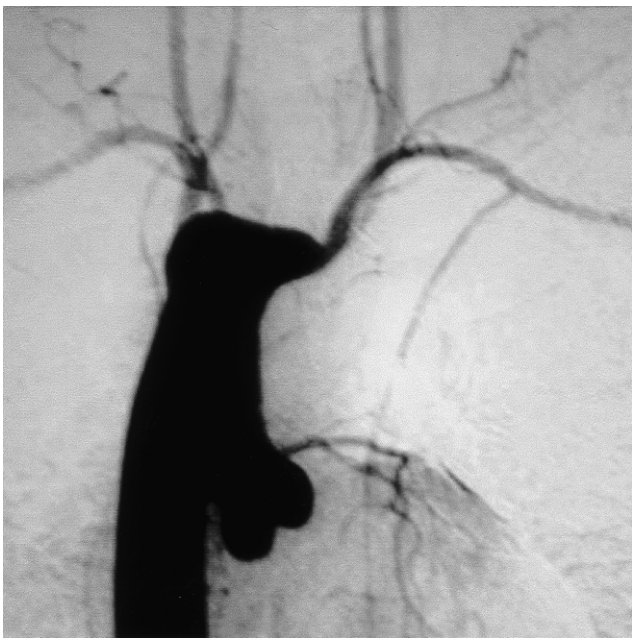

Fig. 4 – The RAO view of an aortography also showed that bilateral carotid and subclavian arteries arose directly from an aortic arch passing through the right thorax.

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